

# TABLE OF CONTENTS

LIST OF TABLES .....	vii
LIST OF FIGURES .....	viii
LIST OF ACRONYMS .....	x
ACKNOWLEDGMENTS .....	xi
MANAGEMENT SUMMARY .....	xii
About This Document .....	xvi

## SECTION ONE: PLANNING CONTEXT AND FOUNDATION

### Chapter 1:

INTRODUCTION .....	1-1
1.1 The Species: <i>Lynx Canadensis</i> .....	1-2
1.1.1 Description .....	1-2
1.1.2 Distribution .....	1-2
1.1.3 The Prey .....	1-5
1.2 Current Status and Conservation Issues .....	1-6
1.3 DNR's Role in Lynx Habitat Management .....	1-8
1.4 Planning Considerations .....	1-9
1.4.1 Assumptions .....	1-9
1.4.2 Plan Scales .....	1-10
1.4.2.1 Ecoprovinces and Ecodivisions .....	1-13
1.4.2.2 Lynx Management Zones .....	1-16
1.4.2.3 Lynx Analysis Units .....	1-17
1.4.2.4 Small Ecosystems/Ecological Communities .....	1-17

## **Chapter 2:**

<b>PATTERNS OF HABITAT USE BY LYNX AND SNOWSHOE HARE</b> .....	2-18
2.1 Lynx Habitat Relationships .....	2-19
2.1.1 Midsuccessional Forests .....	2-19
2.1.2 Mature Forests: Preference or Avoidance? .....	2-20
2.1.3 Mature Forests: Denning Areas .....	2-21
2.1.4 Mature Forests: an Alternative to Open Areas .....	2-23
2.1.4.1 Thermoregulatory Conditions .....	2-23
2.1.4.2 Predator vs. Predator Interaction .....	2-24
2.1.4.3 Rate of Prey Encounter .....	2-25
2.2 The Perspective of the Prey: Predation and Snowshoe Hare Habitat Relationships .....	2-27
2.2.1 Patterns According to Age Class .....	2-27
2.2.2 Patterns in Response to the Ratio of Predators to Prey .....	2-29
2.2.3 Influence of Predator Tactics .....	2-30
2.2.4 Influence of Season .....	2-31
2.2.5 Influence of Physiology .....	2-32
2.3 Landscape Patterns and Processes and Hare Habitat Relationships .....	2-33
2.3.1 The Refugia Concept and Midsuccessional Forest Patches .....	2-33
2.3.2 The Effect of Latitude on Patch Size .....	2-34
2.3.3 Patch Size and Cyclicity: the Case of Snowshoe Hare in Wisconsin ..	2-36
2.3.4 Population Regulation Through Predation .....	2-37
2.3.5 Predator Assemblages and Prey Availability According to Latitude ...	2-37
2.3.6 The Search for the Definition of Optimal Hare Habitat .....	2-39
2.3.6.1 Homogenous vs. Heterogenous Habitats .....	2-39
2.3.6.2 Snowshoe Hare and Mature Forests .....	2-40
2.3.6.3 Snowshoe Hare Vulnerability and Lynx .....	2-41
2.3.7 Synopsis .....	2-42
2.4 The Effect of Landscape Level Hare Dynamics on Lynx .....	2-42
2.4.1 The Prey Density Hypothesis .....	2-43
2.4.2 The Resource Dispersion Hypothesis .....	2-44
2.4.3 Core Density Hypothesis .....	2-44
2.4.4 Do lynx in Washington Follow the Resource Dispersion and Core Density Hypothesis? .....	2-46

## SECTION TWO: MANAGEMENT PLAN

### **Chapter 3:**

#### **DEFINITIONS, MANAGEMENT STRATEGY, AND HABITAT RATIOS . . . . . 3-50**

##### **3.1 Desired Future Condition Statement . . . . . 3-51**

##### **3.2 Classification of Lynx Habitat . . . . . 3-51**

###### **3.2.1 The Landscape: Open Areas . . . . . 3-52**

###### **3.2.2 The Landscape: Lynx Habitat Matrix . . . . . 3-55**

###### **3.2.2.1 Forested Habitat . . . . . 3-55**

###### **3.2.2.1.1 Forage Habitat . . . . . 3-55**

###### **3.2.2.1.2 Denning Habitat and Den Sites . . . . . 3-56**

###### **3.2.2.1.3 Travel Habitat . . . . . 3-56**

###### **3.2.2.2 Temporary Non-lynx Areas . . . . . 3-56**

###### **3.2.3 Travel Routes . . . . . 3-57**

##### **3.3 Developing Habitat Ratios for the LAU's . . . . . 3-57**

###### **3.3.1 Quantifying Temporary Non-lynx Areas: the Lynx Habitat Paradox . . 3-57**

###### **3.3.2 Quantifying the Forage Habitat Ratio . . . . . 3-61**

###### **3.3.2.1 Introduction to the Lynx Habitat Ratio . . . . . 3-64**

###### **3.3.2.2 Influence of Plant Association on the Lynx Habitat Ratio . . . 3-64**

###### **3.3.2.3 Managing the Lynx Habitat Ratio . . . . . 3-66**

###### **3.3.2.4 Temporary Non-lynx Area Limits, Revisited . . . . . 3-70**

###### **3.3.2.5 Cautionary Note . . . . . 3-70**

###### **3.3.3 Quantifying the Denning Habitat Ratio . . . . . 3-70**

##### **3.4 Guidelines and Ratios . . . . . 3-71**

### **Chapter 4:**

#### **CURRENT CONDITIONS AND MANAGEMENT DIRECTION . . . . . 4-85**

##### **4.1 Map Products and LAU Analyses . . . . . 4-86**

##### **4.2 Ecodivisions and Ecoprovinces . . . . . 4-88**

4.2.1 Importance to Lynx .....	4-88
4.2.2 General Characteristics .....	4-90
4.2.3 Current Conditions .....	4-90
4.2.4 Implications for Lynx Habitat Management .....	4-92
4.3 Lynx Management Zones .....	4-94
4.3.1 Okanogan Lynx Management Zone .....	4-94
4.3.1.1 Importance to Lynx .....	4-94
4.3.1.2 General Characteristics .....	4-95
4.3.1.3 Current Conditions and LAU-Specific Recommendations ..	4-100
Loomis-North .....	4-100
Loomis-Central .....	4-102
Loomis-South .....	4-102
Other: North and West Fork Salmon Creek WAU .....	4-103
Other: Summit Creek WAU .....	4-103
4.3.2 Vulcan Mountain Lynx Management Zone .....	4-104
4.3.2.1 Importance to Lynx .....	4-104
4.3.2.2 General Characteristics .....	4-104
4.3.2.3 Current Conditions .....	4-104
4.3.2.4 LAU-Specific Management Direction .....	4-107
4.3.3 Kettle Range Lynx Management Zone .....	4-107
4.3.3.1 Importance to Lynx .....	4-107
4.3.3.2 General Characteristics .....	4-107
4.3.3.3 Current Conditions and LAU-Specific Recommendations ..	4-108
LAU 3 .....	4-108
LAU 4 .....	4-112
LAU 6 .....	4-112
LAU 7 .....	4-112
4.3.4 The Wedge Lynx Management Zone .....	4-112
4.3.4.1 Importance to Lynx .....	4-112
4.3.4.2 General Characteristics .....	4-113
4.3.4.3 Current Conditions and LAU-Specific Recommendations ..	4-113
LAU 11 .....	4-113
LAU 12 .....	4-116
LAU 13 .....	4-117
4.3.5 Little Pend Oreille Lynx Management Zone .....	4-117
4.3.5.1 Importance to Lynx .....	4-117
4.3.5.2 General Characteristics .....	4-117
4.3.5.3 Current Conditions and LAU-Specific Recommendations ..	4-118

LAU 14 .....	4-118
LAU 15 .....	4-122
LAU 16 .....	4-122
LAU 17 .....	4-124
LAU 18 .....	4-124
LAU 19 .....	4-126
LAU 22 .....	4-127
4.3.6 Salmo Priest Lynx Management Zone .....	4-127
4.3.6.1 Importance to Lynx .....	4-12
4.3.6.2 General Characteristics .....	4-127
4.3.6.3 Current Conditions and LAU-Specific Recommendations ..	4-128
LAU 27 .....	4-128
LAU 28 .....	4-132
LAU 29 .....	4-132
<b>Chapter 5:</b> .....	5-135
<b>FUTURE CONDITIONS: LOOMIS STATE FOREST AND LITTLE PEND OREILLE BLOCK</b>	
5.1 Overview of the Modeling Approach .....	5-136
5.1.1 Modeling Parameters used within the Loomis State Forest .....	5-136
5.1.2 Modeling Parameters used within the Little Pend Oreille Block .....	5-137
5.2 Assumptions .....	5-137
5.2.1 Stratifying the Landscape By Vegetation Zone .....	5-137
5.2.2 Matching Silviculture Regimes to Vegetation Zones .....	5-139
5.2.3 Simulating the Effects of Silviculture Treatments: Lynx Habitat Through Time .....	5-139
5.3 Initial Stand Conditions .....	5-141
5.4 Lynx Habitat Predictions for the Planning Period .....	5-141
5.4.1 Loomis State Forest .....	5-141
5.4.2 Little Pend Oreille Block .....	5-143
5.5 Test of Forage Production Assumptions .....	5-145
<b>Chapter 6:</b>	
<b>MONITORING AND EVALUATION</b> .....	6-147

6.1 Monitoring .....	6-148
6.1.1 Implementation Monitoring .....	6-148
6.1.1.1 Forest Management Activities .....	6-148
6.1.1.1.1 Timber Sales .....	6-148
6.1.1.1.2 Silviculture Activities .....	6-148
6.1.1.1.3 Road Construction and Management .....	6-149
6.1.1.2 Field Checks .....	6-149
6.1.1.3 Landscape (LAU) Level Habitat Conditions .....	6-149
6.1.2 Effectiveness Monitoring .....	6-150
6.1.2.1 Evaluating Forage, Travel and Denning Habitat .....	6-150
6.1.2.2 Evaluating Snowshoe Hare Use .....	6-150
6.1.3 Cooperative Research .....	6-151
6.2 Evaluation .....	6-151

### SECTION THREE: CITATIONS AND APPENDICES

LITERATURE CITED .....	LC-153
APPENDIX A: Scientific Names .....	A-169
APPENDIX B: Abridged Guidelines & Ratios .....	B-171
APPENDIX C: Supporting Material for Chapter 5 .....	C-175
C1: Acres under management regimes by decade for the Loomis State Forest, by LAU. .....	C-175
C2: Acres under management regimes by decade for the Little Pend Oreille Block. .....	C-176
C3: Acres of lynx habitat components modeled for the planning period by LAU for the Loomis State Forest and the Little Pend Oreille Block .....	C-176
C4: Regeneration lag sensitivity analysis for Loomis LAU's (acres and % lynx habitat). .....	C-179

## LIST OF TABLES

1. Assumptions adopted in DNR's Lynx Habitat Management Plan. ....	1-9
2. The hierarchal structure of DNR's Lynx Habitat Management Plan. ....	1-11
3. Relative sizes of LAU's and lynx home ranges in Washington. ....	1-13
4. Locations, landforms, and climates of ecodivisions and ecoprovinces within lynx range of Washington. ....	1-14
5. Qualitative descriptions of denning sites at various locations within lynx range. ....	2-22
6. Potential predators of the snowshoe hare. ....	2-28
7. Desired future condition of lynx habitat on DNR-managed lands. ....	3-51
8. Lynx habitat classification system of DNR's Lynx Habitat Management Plan ....	3-53
9. Lynx habitat as quantified in the literature. ....	3-58
10. Historical landscape composition of watersheds in the Methow River Basin estimated from recent fire history records. ....	3-62
11. Plant associations, common names, and group for creating Forage Habitat. ....	3-67
12. Characteristics of plant association groups. ....	3-67
13. Translations of lynx habitat components to inventory records/DNRGIS data used in analysis of DNR-managed lynx habitat and maps. ....	4-87
14. Mean (std. dev.) density (miles per mi <sup>2</sup> ) of transportation routes, trails, ridges and saddles, and rivers and streams within lynx habitat, by Lynx Management Zone. ....	4-89
15. Major and minor plant communities of the two ecoprovinces within Washington's lynx range. ....	4-91
16. Total acres, lynx habitat potential, number of LAU stratifications, and estimated lynx populations within the LMZ. ....	4-92
17. DNR-managed lands within the Lynx Management Zones of Washington. ....	4-93
18. Current lynx habitat components on DNR-managed lands within LPO Block. ....	4-126
19. Summary of current conditions within LAU's containing DNR-managed lands by habitat component in acres (% of lynx habitat). ....	4-133
20. Distribution of vegetation zones in the three Loomis LAU's. ....	5-138
21. Distribution of vegetation zones in the Little Pend Oreille Block. ....	5-138
22. Little Pend Oreille Block management regimes by vegetation zone. ....	5-139
23. Age criteria used in SNAP modeling of lynx habitat through time. ....	5-140

## LIST OF FIGURES

1. Distribution of the lynx, <i>Lynx canadensis</i> . . . . .	1-3
2. Primary distribution of lynx in Washington, the six Lynx Management Zones. . . . .	1-4
3. The hierarchial relationship of the four scales used in the Washington Department of Natural Resources Lynx Management Plan. . . . .	1-12
4. Ecoprovinces of northeastern Washington. . . . .	1-15
5. Densities of lynx during cyclic population lows. . . . .	1-48
6. The lynx habitat classification system of the Washington Department of Natural Resources Lynx Management Plan. . . . .	3-54
7. A large scale perspective of lynx habitat. . . . .	3-60
8. The proportions of Temporary Non-lynx Areas required to produce various proportions of Forage Habitat according to Lynx Habitat Ratio. . . . .	3-65
9. Time a stand spends in lynx habitat categories by grouped vegetation associations and silviculture treatment. . . . .	3-68
10. Theoretical proportion of lynx habitat categories available in each LAU of the Loomis State Forest based on the vegetative association groups occurring within each LAU. . . . .	3-69
11. Travel routes identified for three LAU's in the Loomis State Forest. . . . .	3-72
12. Sample travel route system and management over two phases. . . . .	3-73
13. DNR-managed lands and potential ridge travel routes within the Okanogan LMZ. . . . .	4-96
14. Current lynx habitat components on the Loomis State Forest within the Okanogan LMZ. . . . .	4-97
15. Lynx habitat categories within the Okanogan LMZ: a) Loomis State Forest, and 2) Southwest Okanogan. . . . .	4-98
16. Current lynx habitat components on DNR-managed land within the southern Okanogan LMZ. . . . .	4-99
17. Vegetative associations of LAU's within Loomis State Forest. . . . .	4-101
18. Current lynx habitat components within the Vulcan Mountain LMZ. . . . .	4-105
19. Characteristics of lynx habitat containing DNR-managed land within the Vulcan Mountain LMZ: a) habitat categories, and b) primary species. . . . .	4-106



20. Current lynx habitat components within the Kettle Range LMZ. ....	4-109
21. Characteristics of lynx habitat on LAU's containing DNR-managed lands within the Kettle Range LMZ: a) habitat categories, and b) primary species. ....	4-110
22. Current lynx habitat components within the Kettle Range LMZ: LAU 3 and 4. ....	4-111
23. Current lynx habitat components within the Wedge LMZ. ....	4-114
24. Characteristics of lynx habitat on LAU's containing DNR-managed lands within the Wedge LMZ: a) habitat categories, and b) primary species ....	4-115
25. DNR-managed lands within the Little Pend Oreille LMZ. ....	4-119
26. Characteristics of lynx habitat on LAU's containing DNR-managed lands within the Little Pend Oreille LMZ: a) habitat categories, and b) primary species. ....	4-120
27. Current lynx habitat components within the Pend Oreille LMZ: LAU 14 and 15. ....	4-121
28. Current lynx habitat components within the Pend Oreille LMZ: LAU 16. ....	4-123
29. Current lynx habitat components within the Pend Oreille LMZ: LAU 17, 18, and 19. .	4-125
30. Current lynx habitat characteristics within the Salmo Priest LMZ. ....	4-129
31. Characteristics of lynx habitat on LAU's containing DNR-managed lands within the Salmo Priest Zone: a) habitat categories, and b) primary species. ....	4-130
32. Current lynx habitat components within the Salmo Priest LMZ: LAU 27, 28, and 29.	4-131
33. Projected lynx habitat components throughout the planning period on the Loomis State Forest, by five year period. ....	5-142
34. Projected lynx habitat components on the Little Pend Oreille Block throughout the planning period. ....	5-144
35. Sensitivity analysis of regeneration lags by LAU in the Loomis State Forest. ....	5-146

## **LIST OF ACRONYMS**

The following acronyms are used in the text and citations of the Lynx Habitat Management Plan:

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<b>BC</b>	<b>British Columbia</b>
<b>DEM</b>	<b>Digital Elevation Model</b>
<b>DNR</b>	<b>Washington Department of Natural Resources</b>
<b>FRIS</b>	<b>Forest Resource Inventory System</b>
<b>FVS</b>	<b>Forest Vegetation Simulator</b>
<b>GIS</b>	<b>Geographic Information System</b>
<b>LAU</b>	<b>Lynx Analysis Unit</b>
<b>LHR</b>	<b>Lynx Habitat Ratio</b>
<b>LMZ</b>	<b>Lynx Management Zone</b>
<b>PHS</b>	<b>Priority Habitats and Species Program</b>
<b>SNAP</b>	<b>Scheduling Network and Analysis Program</b>
<b>US</b>	<b>United States</b>
<b>USDI</b>	<b>United States Department of the Interior</b>
<b>USFS</b>	<b>United States Forest Service</b>
<b>USGS</b>	<b>United States Geological Survey</b>
<b>USFWS</b>	<b>United States Fish &amp; Wildlife Service</b>
<b>WARIS</b>	<b>Washington River Information System</b>
<b>WAU</b>	<b>Watershed Analysis Unit</b>
<b>WDFW</b>	<b>Washington Department of Fish &amp; Wildlife</b>
<b>WDW</b>	<b>Washington Department of Wildlife</b>
<b>WRIA</b>	<b>Watershed Resource Inventory Area</b>

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## MANAGEMENT SUMMARY

Lynx are currently listed as “threatened” in the state of Washington. Located on the southern margin of the lynx’s trans-North American distribution, the areas occupied by lynx in Washington represent one of two places where reproducing populations exist south of Canada.

The Washington Department of Natural Resources [DNR] manages 5% of the primary lynx habitat in Washington, including some land in each of the six areas of current lynx range defined by the Washington Department of Fish and Wildlife’s [WDFW]. Hereafter, these areas will be referred to as Lynx Management Zones [LMZ]. Most (75%) of this land is in the Okanogan LMZ, within DNR’s Loomis State Forest. This plan outlines DNR’s commitment to incorporate lynx habitat associations into its timber management plans, within DNR’s legal mandate to provide revenue for trust beneficiaries. This plan also responds to the opportunity provided to DNR by the Washington Forest Practices Board to develop a special wildlife management plan pursuant to WAC 222-16-080 (2) in lieu of the Board developing rules to protect lynx habitat under the critical wildlife habitat designation.

DNR’s lynx habitat management plan adopts a hierarchical approach to accommodate the multi-scaled habitat needs of lynx. The four scales are 1) Ecoprovince/Ecodivision, 2) Lynx Management Zone, 3) Lynx Analysis Unit, and 4) Small Ecosystem/Ecological Community. The scale and focus for most management direction is WDFW’s Lynx Analysis Unit [LAU]. Where DNR manages less than 20% of an LAU, guidelines for the other scales will be applied to maintain the habitat quality of these areas.

### *Ecoprovince/Ecosystem*

At larger scales, habitat connectivity issues are incorporated to benefit both resident and non-resident lynx. A system of travel routes will be maintained along major ridges, saddles, and streams to connect DNR-managed lands with neighboring lynx habitat throughout the LMZ. A special management zone will straddle the route so that a corridor at least 330 feet (100m) wide is available to lynx at all times. On average, the forested zone along the travel route will likely be much wider. Actual boundaries of the zone straddling the travel route will reflect the existing contours of the landscape.

Where the travel route is naturally forested, forested habitat conditions will be encouraged. If harvest activities must occur within the zone, openings will be minimized (<330 feet or 100m wide), techniques to ensure regeneration will be employed, and forested areas will be left to provide lynx with alternative travel routes. If a road must be placed on ridges or saddles due to slope stability or water quality concerns, road width will be minimized, vegetative cover will be encouraged on both sides of the roads, sight distance will be reduced (<330 feet or 100m wide), and/or the road will be closed to vehicles as soon as possible. At the least, frequent use of such roads will be discouraged.

### *Lynx Management Zone*

Harvest units on DNR-managed lands in critical positions within LMZ, such as in narrow constrictions or near the British Columbia border, will be designed to promote connectivity within the LMZ.

### *Lynx Analysis Unit*

At the LAU-level, habitat ratios and dispersion guidelines reflect the habitat needs of individual or family groups of lynx (Chapter 3). The ratios are based on maintaining the quality of each of four LAUs where DNR manages at least 20% of the area. The strategy emphasizes providing habitat for snowshoe hare, as lack of prey is currently considered the limiting factor for lynx in Washington (WDFW 1996). Also, an overall habitat quantity ratio (total forested habitat) is given to limit temporary loss of habitat for lynx and hare resulting from the creation of new Forage (prey) habitat. Denning Habitat and den site ratios are also prescribed to provide lynx with denning opportunities through time. The ratios for DNR-managed lands are as follows:

Lynx Habitat:	<b>Forested Habitat</b>	70% minimum
	<b>Temporary Non-lynx Areas</b>	30% maximum
Within Forested Habitat:	<b>Forage Habitat</b>	20% minimum
	<b>Denning Habitat</b>	10% minimum
	Den sites	≥ 2 sites/square mile

The habitat ratios are based on the total acres of potential forested lynx habitat per LAU (total LAU acres minus permanent natural openings and sparsely forested areas that cannot be managed as lynx habitat).

Management attention is also focused on the configuration of habitat components to ensure connectivity at the LAU scale. Forage Habitat will be connected to other forested habitats, so that it is adjacent to or near (<3 miles) Denning Habitat. More than 50% of the periphery of Denning Habitat will be bordered by forested habitat at all times to avoid isolation of Denning Habitat. Finally, human-related disturbance will be minimized with road and harvest plans. Examples include rehabilitation of non-essential roads after harvest, gate placement to limit vehicular access (including snowmobiles), and avoidance of loop roads.

### *Small Ecosystem/Ecological Community*

Smaller scale guidelines are provided to enhance the quality of Forage and Denning Habitat within the LAU, regardless of the proportion managed by DNR. Specifically, harvest units will

be designed to promote swift vegetative regeneration and snowshoe hare/lynx recolonization. Unit size and shape will reflect and enhance the regeneration capacity of the site, provide a diversity of forage and browse opportunities for the lynx and hare, and contribute to a diverse mosaic of habitat patches available to snowshoe hare and lynx. Unit composition will provide opportunities for rapid hare recolonization by containing clumps of vegetation and/or slash within harvest units. Regeneration techniques will reflect the unit's potential to produce quality hare habitat (according to vegetation association) and may involve use of fire or soil scarification techniques.

Quality winter snowshoe hare browse and cover within Forage Habitat will be maintained by providing horizontal cover densities >40% cover for at least 3.3 feet (1m) above average snow level using a vegetation profile board according to Nudds (1977). Browse and cover will be provided by tree species preferred by snowshoe hares, if preferred species are identified for the area. Otherwise, regeneration efforts will focus on creating the cover preferred by hares, rather than the species (Ferron and Oulette 1992). Thinning, partial harvests, lopping, or other treatments will be considered to prolong forage conditions and/or to create forage opportunities in understories of mature stands.

The highest priority denning habitat will contain known lynx den sites. WDFW will provide the locations of known lynx dens to ensure that sites which currently or historically supported lynx dens are protected. Stands that contain suitable den sites such as deadfall arranged to provide structural diversity 1-4 feet (0.3-1.2 m) above ground will be maintained as potential Denning Habitat. Preference will be given to stands that: a) possess all or most of the structural elements of Denning Habitat, b) contain more than one den site, and c) are mature to over-mature stands of spruce/fir or similar mesic association with north or northeast aspects. Potential human related disturbance to Denning Habitat will be minimized by locating these sites as far from roads as practical, where DNR manages more than 20% of a LAU (goal: distance between roads and den sites is >¼ mile, WDFW 1996).

To ensure that den sites are available across the landscape, two den sites per square mile will be provided. These sites may overlap with the Denning Habitat identified in LAU's where DNR manages at least 20% of the area. If so, the sites will be situated in stands of at least 5 acres, following WDFW (1996). Priority for den sites will be 1) known den sites, 2) den sites within current Denning Habitat, and 3) den sites within other habitat types. If no existing denning structure can be found, den sites may be artificially constructed. DNR wildlife biologists will coordinate with WDFW to survey existing den sites and recommend details of artificial den size and structure.

#### *Current Conditions*

Most of the LAUs containing DNR-managed land currently meet the overall forested habitat quantity ratio but are deficient in Forage Habitat (Chapter 4). Potential Denning Habitat is available in most areas, but will require future field checks to determine the actual quantity present. Areas have been identified for future surveys.

### *Plan Feasibility*

Computer-modeled projections of lynx habitat components within the four LAU where DNR-manages more than 20% of the LAU confirm that DNR will maintain a minimum of 70% Forested Habitat per LAU through the 80 year planning period. The minimum 20% Forage Habitat ratio was not met in most planning periods, but this result is a likely result of conservative estimates of Forage duration. Potential Denning Habitat was available throughout the planning period, and a general trend within each LAU toward more evenly distributed proportions of lynx habitat categories was observed.

### *Monitoring and Evaluation*

DNR will monitor and evaluate the implementation and effectiveness of this Lynx Habitat Management Plan (Chapter 6). For implementation monitoring, 1) forest management activities will be reported, 2) field surveys of representative management activities will be conducted, and 3) LAU-level lynx habitat conditions will be updated. For effectiveness monitoring, representative stands will be sampled to 1) verify their suitability as forage, travel, and denning habitat, and 2) assess snowshoe hare use of stands. DNR will provide WDFW with an annual report describing these monitoring activities.

After the completion of the first field season of monitoring, DNR will meet with WDFW to discuss results pertaining to a) post-harvest conditions in Travel Habitat, b) development of Forage Habitat, and c) the suitability of areas classified as Denning Habitat. . Subsequently, evaluations of this plan will occur at five year intervals so that new information and monitoring results can be adapted into this plan. Changes to the plan that are prompted by the evaluations will be made by mutual agreement of DNR and WDFW.

## About this Document...

### Section One: Context and Foundation

**1. INTRODUCTION...** introduces the species of concern, highlights the planning context, and identifies the planning considerations that influenced this document.

**2. PATTERNS OF HABITAT USE BY LYNX AND SNOWSHOE HARE...** familiarizes the reader with what is known and unknown about lynx and hare habitat relationships. Topics covered range from stand to landscape scales, forming the foundation from which the lynx management plan was derived.

### Section Two: Management Plan

**3. DEFINITIONS, MANAGEMENT STRATEGY, AND HABITAT RATIOS...** contains the standards used to judge current conditions of lynx habitat and guidance used to direct future activities on DNR-managed lands within lynx range.

**4. CURRENT CONDITIONS AND MANAGEMENT DIRECTION...** Lynx Analysis Units containing DNR-managed land are identified, current conditions of lynx habitat is analyzed, and future management direction is given.

**5. FUTURE CONDITIONS: LOOMIS STATE FOREST & LITTLE PEND OREILLE BLOCK...** contains computer-modeled projections of lynx habitat components within four Lynx Analysis Units through the 80 year planning period, reflecting the guidance and standards developed in the previous chapter.

**6. MONITORING & EVALUATION...** describes evaluation and monitoring of planned activities.